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ABSTRACT

This study attempts to investigate the effects of increased maternal visual regard on neonatal social visual behavior and upon patterns of mother-neonate interaction within the context of a learning theory paradigm. Subjects were 3-day-old neonates and their mothers; with 10 of the 15 mother-neonate pairs as the experimental group, and 5 as the control group. Using an ABA experimental design, the investigation employed a modified time-sampling procedure with two observers simultaneously watching the neonate-mother interaction and recording a precoded list of variables on a special coding sheet. Experimental mothers were asked to increase the amount of time they spent looking into their babies' eyes without changing any of their other normal caretaking/interacting behaviors during the second phase. For the return to baseline phase, mothers were asked to disregard previous instructions and return to their normal routines of caretaking/interacting. Control mothers were given no instructions governing their interacting behaviors. Trend analyses were performed to explore experimental phase differences and correlations were computed for maternal neonatal variables according to group. Results indicate that increased maternal visual regard appears to have had effects upon neonatal social visual behaviors and patterns of neonate-mother interaction. It was found that the patterns of interrelationship of maternal and neonatal behaviors were strikingly different for the two groups. In addition, control mothers talked more often to their daughters than their sons and experimental mothers talked equally to sons and daughters. (Author/SB)

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The Effects of Increased Maternal Visual Regard of Neonate Upon the Neonate-Mother Interaction

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Social visual communication is an extremely significant social phenomenon. Within the realm of adult interaction, behavior has been well-established (e.g., Argyle and Dean, 1965). Furthermore, within the context of mother-infant interaction, several investigators have noted the effects of infant visual regard upon maternal feelings and behaviors (Klaus, Kennell, Plumb, and Zuelhke, 1970; Moss and Robson, 1968; Rheingold, 1961; Robson, 1967; Wolff, 1961). Early infant visual regard of mother appears to be a very pleasurable, reinforcing experience for the mother. This importance of early social visual communication is not restricted to mothers of full-term infants but also applies to mothers of premature infants (Klaus and Kennell, 1971). Further highlighting of the saliency of the visual communication to the mother or caretaker is found in the literature on blind infants (Fraiberg, 1974) and autistic infants (Hutt and Ounstead, 1966).

These studies of the phenomenon of mutual visual regard have, however, been one-sided. The complementary aspect of the phenomenon of mutual visual regard concerns the effects of maternal visual regard of the infant upon the infant's behaviors. The data reflect the reinforcing, affectional connotations of infant social visual regard upon the mother. Now what can be said of the effects of maternal visual regard upon the neonate's behaviors? Moreover, how does the phenomenon of mutual visual regard fit into the total pattern of neonate-mother interaction?

The present study was undertaken to explore these questions within the context of a learning theory paradigm. Previous research in neonatal learning has been concerned with demonstrating conditioning of very basic responses to primary, appetitional or, at best, nonsocial

stimulation, within relatively strict experimental paradigms. While these paradigms involve multiple advantages including strict laboratory control, one disadvantage is these approaches is the unliklihood of reflection of contingencies in the natural environment. The present research design was implemented within the context of the natural neonate-mother feeding interaction during the post-partum hospital stay. It represents the first attempt to employ social stimulation (maternal visual regard) as the independent variable and to measure neonatal social responses (social visual behaviors) as some of the dependent variables in a study of neonatal-maternal interaction from the learning approach to neonatal development.

Subjects

The subjects for this study were a group of fifteen healthy three-day old neonates and their mothers selected from the West Virginia University Medical Center Newborn Nursery, in Morgantown, West Virginia. Infants born without complications from October, 1974, to June, 1975, were potential subjects for the study. Only neonates who were predominately alert throughout all of the observational sessions were included in the data analyses. Fifty-six mother-infant pairs were observed; however, due to instability of infant state, only fifteen of these subjects were included in the final data analyses. Ten of the 15 mother-neonate pairs served as the experimental group, and five served as the control group. The experimental group consisted of five miles and five females; four were breast-fed, six were bottle-fed. three were born to primaparous mothers, and seven were born to multiparous mothers. The control group consisted of two female and three male neonages; three were bottle-fed, two were

breast-fed; three were firstborns, and two were born to multiparous mothers.

Procedure

Using an ABA experimental design, the investigation employed a modified time-sampling procedure with two observers simultaneously watching the neonate-mother interaction and recording a precoded list of variables on a special coding sheet. In addition to infant initial and predominant state, an array of maternal and neonatal variables were observed. They are depicted in the Table 1.

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Insert Table 1 about here

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The time-sampling observation units were ten seconds in length separated by five-second coding intervals. Occurence of mother-infant behaviors were scored on printed, pre-coded forms, and then percentages of time spent in each of the variables, dependent upon length of the sessions, were computed for each observation. Mother-infant pairs were observed during hospital feeding sessions on the infant's third postnatal day.

Before the sessions began, one of the observers would enter the mother's room to introduce herself/himself and to engage in brief conversation with the mother to alleviate some of the impersonality of the observational procedure. The first observation of the dyads served as a baseline record of time spent in each of the behavioral categories; the second observational period was the experimental period, and the third period served as the return to baseline phase.

Before the experimental phase began, one observer would explain the details of the manipulation to the mothers, who, with their neonates, were serving as the experimental subjects. These mothers were asked to increase the amount of time they spent looking into their babies' eyes without changing any of their other normal caretaking/interacting behaviors during this second phase. For the return to baseline phase, mothers were asked to "act naturally" i.e., to disregard the previous instructions and return to their normal routines of caretaking/interacting without specifically concentrating on visual responsivity. An observer would also talk with the mothers of the control group before the observational sessions. However, this talk consisted of general conversation only; the control mothers were given no instructions governing their interacting behaviors.

We were primarily interested in the group X experimental phase distributions of social visual behaviors and in the overall patterning of neonate-mother interaction. Trend analyses were performed to explore these group X phase differences. For the neonate-mother pairs in the experimental group, social visual behaviors increased from baseline to experimental phase and then decreased in the return to baseline phase. For the dyads in the control group, these corresponding phase-to-phase changes did not occur.

Figures 1, 2, and 3 reveal these groups X phase differences. The first Figure depicts the group X phase differences in the variable of M L I. Figure 2 reflects these differences for the variable of Infant looking at Mother given eyes open. Figure 3 reveals the group X phase changes for eye contact or mutual visual regard.

Insert Figure 1, 2 & 3

A significant quadratic trend was obtained for the curve of M L I, experimental group (F [1,8]+ 27.05, PL.0001) while a line or trend was obtained for the control group.

For the variable of infant looking at mother given his/her eyes open, the experimental group data exhibited a significant quadratic trend F(1, 18)= 7.25, p .01, and the control group data revealed a significant linear trend F(1,8)= 5.34, p .05. While the experimental group's patterning or eye contact again revealed a significant quadratic trend F(1,18)= 13.36, p .001 that of the control group was approaching a linear trend (p. .15). Thus the patterns of social visual communication for the two groups were very different; the experimental mothers and infants showed a curvilinearity of social visual communication across phases, and the control pairs evidenced linear declines in their patterns of social visual communication.

Pearson Product Moment Correlational coefficients were also computed for the maternal and neonatal variables according to group; these coefficients further highlight the differences in patterns of neonate-mother interaction between the two groups.

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Insert Tables 2 and 3 about here

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For the experimental group, infant looking at mother given his/her eyes open and neonate mother eye contact are significantly positively related to mother looking at infant, mother talking to infant, and infant not sucking, and negatively correlated with mother holding away and mother shouldering infant, as can be seen in the next table. The

only variables correlated with neonatal social visual behaviors in the control group were mother holding away (which held a negative correlation with infant looking at mother given his/her eyes open and eye contact) and infant sucking (which held a positive correlation with infant looking at mother given his/her eyes open). Mother looking at infant was not correlated with the neonatal social visual behaviors or any of the other behavioral variables except infant not sucking. Thus, mothers of the control group tended to look at their neonates when they were not sucking and the neonates tended to look at their mothers when they were sucking-another instance of the difference in contingencies and reciprocities between the two groups.

In addition to the group X phase differences in trends of social visual behaviors and in patterns of neonate-mother interaction, another interesting finding was a significant sex X group effect for the variable of M T.

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Insert Figure 4 about here

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As Figure 4 reveals, mothers in the experimental group talked relatively equally to their sons and daughters whereas mothers in the control group talked significantly more to their daughters than to their sons $F(1,11)=$ p .05).

Discussion

This study was designed to investigate the effects of increased maternal visual regard upon neonatal social visual behaviors and upon patterns of mother-neonate interaction. The results indicate that

as early as 3 days postpartum, increased maternal visual regard appears to have had effects upon neonatal social visual behaviors and patterns of neonate-mother interaction.

In particular, it was found that while mothers and neonates of the experimental group were experiencing corresponding heightening of social visual communication in the experimental phase, mothers and neonates of the control group were not experiencing this enhanced social visual communication and were, in fact, undergoing declines in their frequencies of social visual communication. Furthermore, the patterns of interrelationships of maternal and neonatal behaviors were also strikingly different for the two groups. While maternal and neonatal social visual behaviors significantly covaried in the experimental group, a distinct lack of synchrony in social visual communication was noted among the dyads of the control group.

Finally, sex by group distributions of maternal talking were found to be very different for the two groups. The control mothers spent considerably more time talking to their daughters than to their sons whereas the experimental mothers talked approximately equally to both daughters and sons. Other investigators (e.g., Thoma, Leiderman, and Alson (1972)) have also found that mothers spend more time talking to their female infants than to their male infants. Perhaps mothers who did not receive any instructions governing the nature of the interaction were responding more according to their own sets of sex-role expectations. In an overall view, then the mothers and their sons and daughters in the experimental group seem to have experienced a heightened socially stimulating interaction

characterized by enhanced sensitivity and responsivity and an absence of sex-role dependent responses. The control group's interaction appeared to have been centered more on caretaking activities than social interactive behaviors and reflected sex-role dependent maternal behavior and dsynchroncus social visual communication.

It is felt that the instructions to increase social visual regard of infant; i.e., to initiate and sustain the opportunity for mutual visual regard were beneficial to the mother-infant pair. The possible advantages of increased maternal visual regard--heightening maternal sensitivity, enhancing the occurence of mutual visual regard, and facilitating the development of early discrimination of an attachment to the mother figure--are believed to be most significant in the neonatal stage of development.

The findings of this study are felt to be important for several additional reasons: The first consideration involves the importance o visual regard to the very young infant. This study represents a departure from the question of the effects of early infant visual regard upon the mother toward an investigation of early maternal visual regard upon the very young infant. Recent evidence from Tronick, Adamson, Wise, Als, and Brazelton (1975) and Shelton and Slaby (1975) indicates that the social distal interactional system is very important for slightly older infants. Our data confirm this importance of social visual regard for infants as young as three days of age. Secondly, this study reflected an original look at neonatal social responses as a dependent measurement. The choice of visual regard of mother and participation in eye contact in alert, three-day-old infants was found

to be feasible response choice. Finally, the theoretical and clinical implications of the data are felt to be very significant. If the young infant as early as three days postpartum is responsive to changes in subtle social stimulation and can change his/her behaviors accordingly, then these findings hold great potential for those neonate-mother dyads who are experiencing interactional difficulties and/or problems with synchronous social communication.

The most important unanswered question prompted by this regard is the determination of the exact role(s) of the increased maternal visual regard. Did this stimulation have reinforcing effects or/and eliciting effects upon neonatal social visual behaviors? Since the manipulation involved continuously heightened visual regard during the second phase (in simulation of the natural role of the mother, as, accoding to Stern, "an almost continuously gazing 'listener'") the question of the role of the social stimulation as a reinforcing or eliciting stimulus is equivocal. In accordance with this primary question of the determination of the role(s) of maternal visual regard is a similar question suggested by the positive correlation mother talking and infant looking at mother given his/her eyes open and eye contact. Does maternal talking function as a reinforcing or eliciting stimulus for neonatal social visual behaviors? If so, what are the relative efficacies of maternal looking versus maternal talking in these roles? Stern has found that the likelihood of three-month-old infants' visual regard of mother is increased by maternal vocalization and Schwarta, Rosenberg, and Brackbill (1970) have found no differences in effectiveness of social

visual social auditory, and social tactile stimuli as reinforcement for three-month-olds' vocalizations.

Thus the questions of the exact roles of and the comparative and cumulative efficacies of maternal social visual and auditory social stimulation upon neonatal social visual behaviors are as yet unanswered. They are the topics of continued research in this very salient area of neonate-mother social interaction.

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TABLE 1

VARIABLES OBSERVED DURING NEONATE-MOTHER INTERACTION

Mother looking at infant	MLI
Mother talking to infant	MT
Mother smiling	MS
Mother stimulating infant's body	MSB
Mother stimulating Infant's head	MSH
Mother stimulating infant with nipple	MSN
Mother holding infant away	MHA
Mother shouldering infant	MSI
Infant sucking	IS
Infant attached but not sucking	INS
Infant's eyes open	EO
Infant looking at mother given eyes open	ILM/EO
Infant-mother eye contact	EC

TABLE 2

EXPERIMENTAL GROUP CORRELATIONS BETWEEN MOTHER-INFANT BEHAVIORS

	MLI	MT	MS	MSB	MHIA	MSI	MSC
A. M looks at I							
B. M talks to I							
C. M smiles		.48					
D. M stimulates it's body		.38	.38				
E. M stimulates it's head			.47	.50			
F. M holds I away		-.35					
G. M. shoulders I		-.48			.55		
H. M-I eye contact	.36	.50			-.37	-.51	
I. I looks at M given eyes open	.34	.51			-.47	-.53	.37
J. I sucking					-.43		
K. I not sucking		-.37					.33

TABLE III

	MLI A	MT B	MSB D	MHA F	EC G	ILMEO H	IS I
A. M looks at I							
B. M talks to I							
C. M Smiles		.65					
D. M Stimulates I's body		.51					
E. M stimulates I's head			.69				
F M holds I away							
G. M-I eye contact				-.48			
H. I looks at M given eyes open				-.69	.69		
I. I sucking			-.52	-.49		.64	
J. I not sucking	.47		.69				-.54

Figure 1

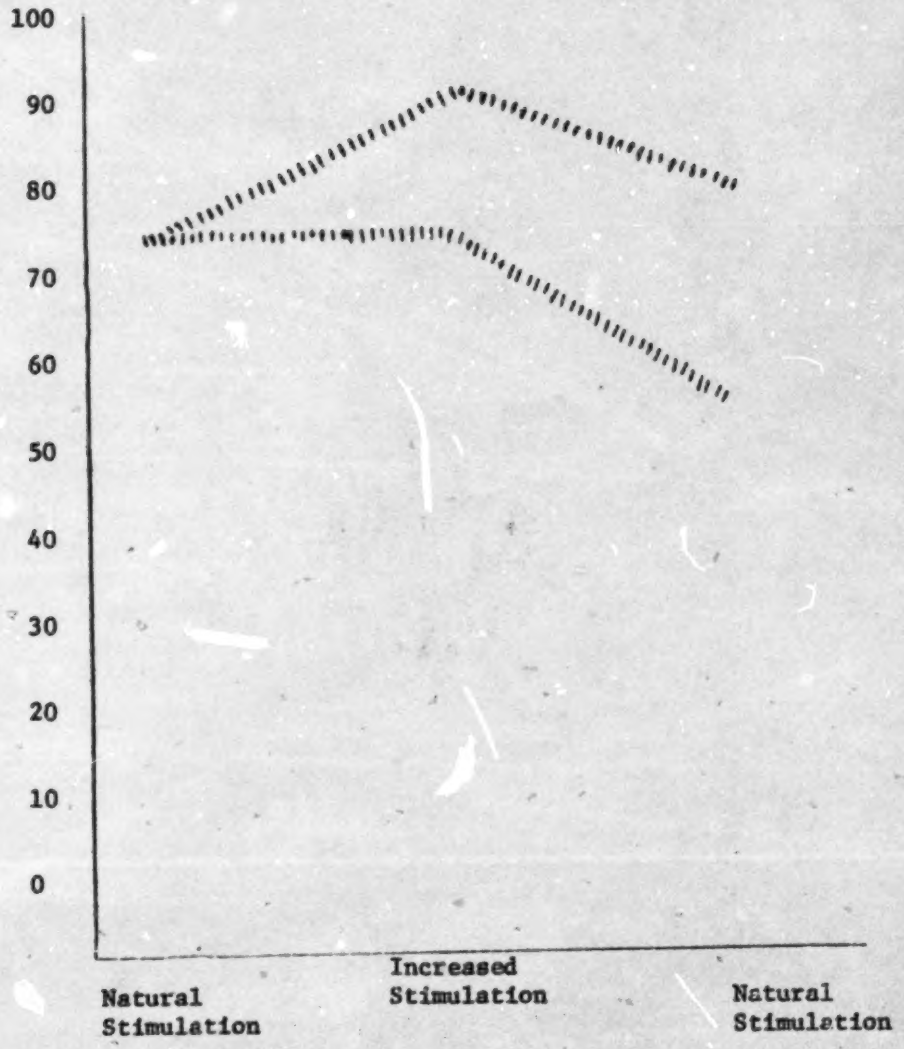
100
90
80
70
60
50
40
30
20
10
0
Natural Stimulation
Increased Stimulation
Natural Stimulation
EXPERIMENTAL CONDITIONS

Figure II

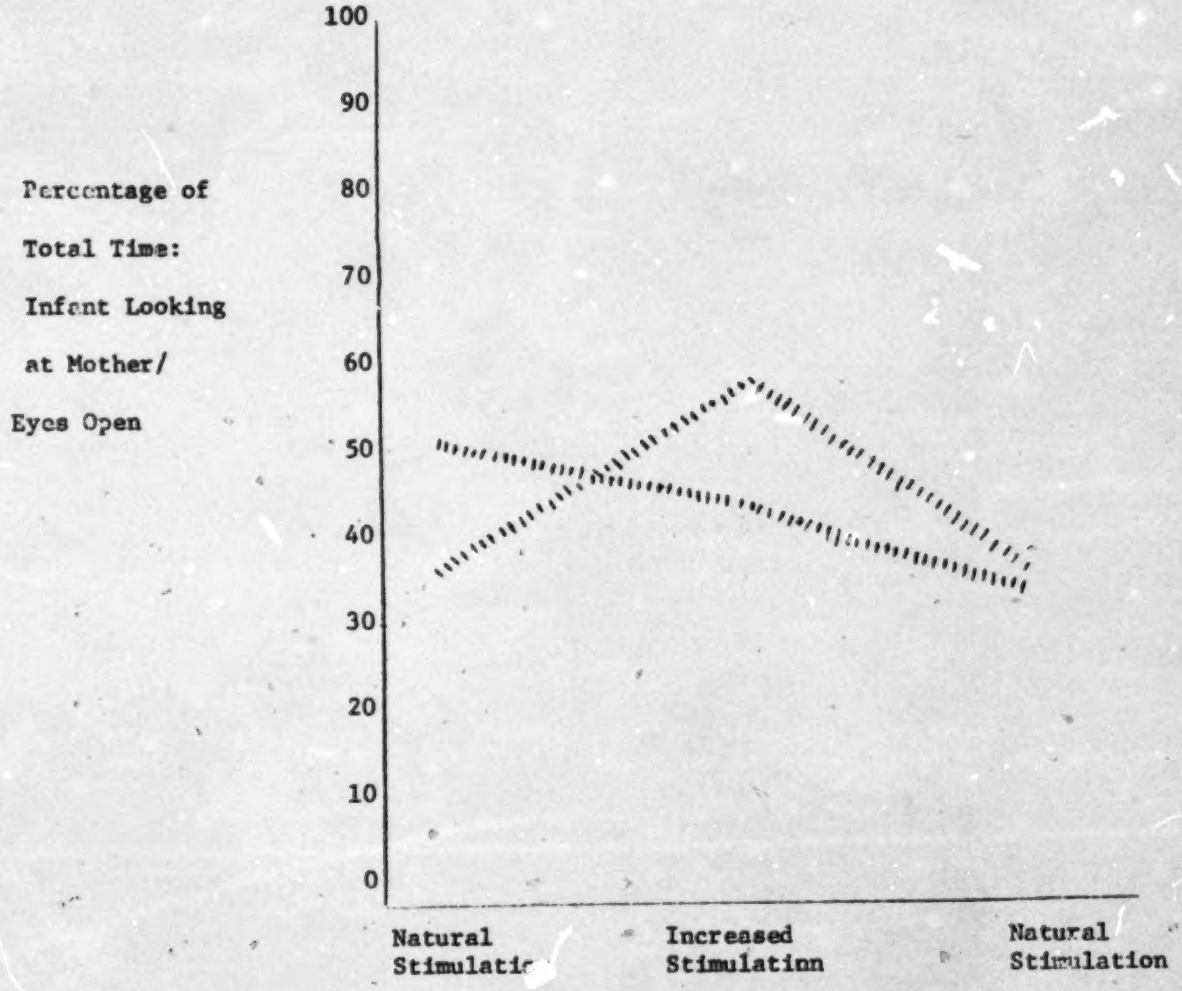
Percentage of Total Time: Infant Looking at Mother/ Eyes Open
100
90
80
70
60
50
40
30
20
10
0
Natural Stimulatio
Increased Stimulation
Natural Stimulation
EXPERIMENTAL CONDITIONS

Figure III

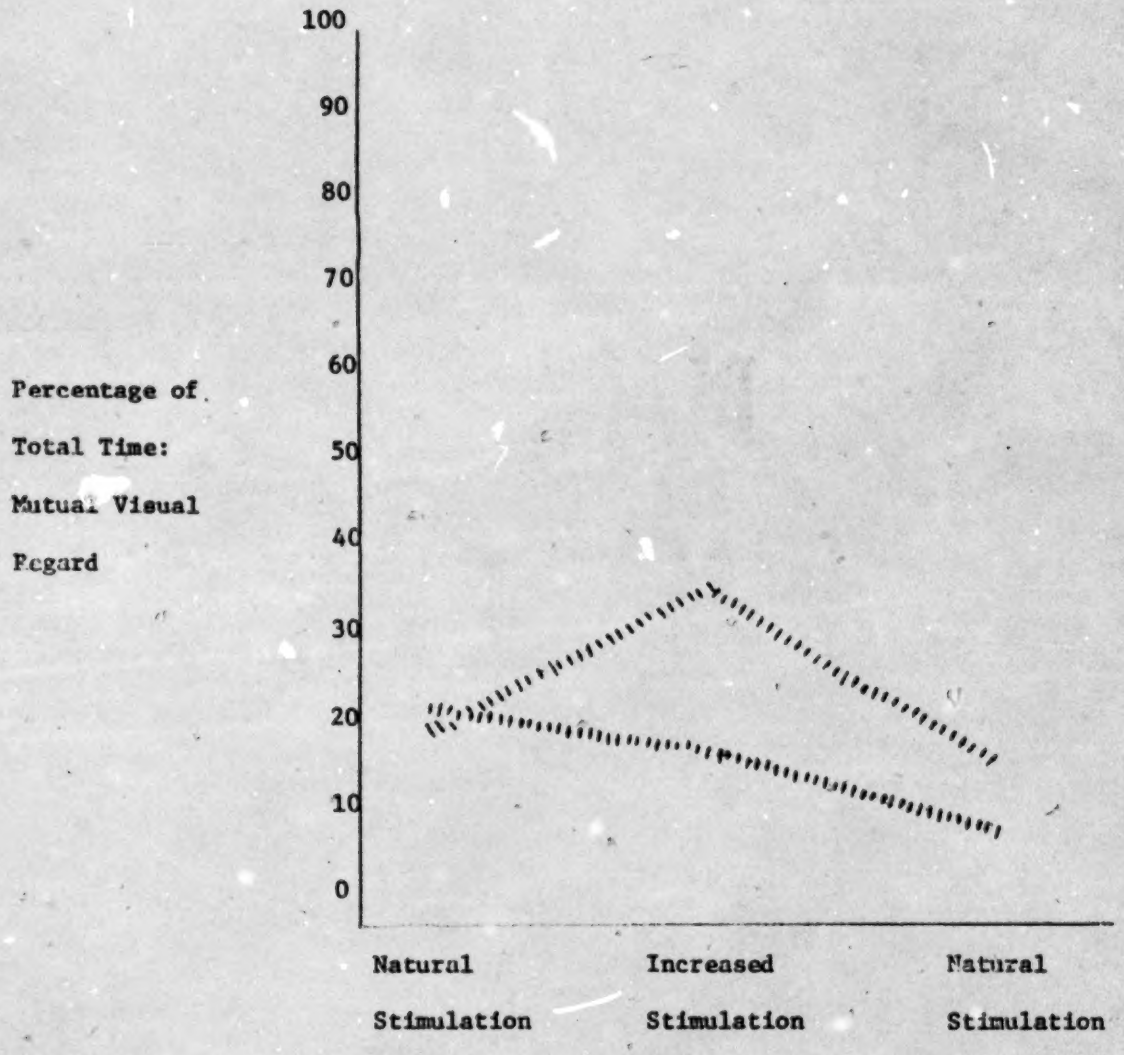
100
90
80
70
60
50
40
30
20
10
0
Percentage of Total Time: Mutual Visual Regard
Natural Stimulation
Increased Stimulation
Natural Stimulation
EXPERIMENTAL CONDITIONS

Figure IV

SEX BY GROUP LEVELS OF MOTHER TALKING